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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/809,036	03/16/2001	Mark Allmen	37112-167615	5594

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EXAMINER	
SENFI, BEHROOZ M	
ART UNIT	**PAPER NUMBER**
2621	

DATE MAILED: 09/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/809,036	ALLMEN ET AL.	
	Examiner	Art Unit	
	Behrooz Senfi	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 06/20/2006 have been fully considered but they are not persuasive.

Response to remarks:

Applicant asserts (remarks, filed 06/20/2006, page 10, last paragraph) that Yang fails to teach "encoding the video sequence based on balancing bits per pixel for the background composite with bits per pixel for foreground to achieve similar quality between background composite and foreground regions in a reconstructed video sequence" because the techniques taught by Yang are on a per frame basis.

In response:

With respect to applicant first arguments: It is submitted that claim language broadly recites the process of encoding a video sequence without any specifics regarding the encoding procedure and does not exclude encoding per frame basis; Yang reference was used for the explicit teaching of "balancing bits per pixel for controlling/adjusting the video quality between foreground/region of interest and background of the video frame/image. Yang disclosure teaches, a video system including video camera 202 which capture and transmits a sequence of video images/frames (i.e. as stated in the specification "page 13" of the instant application; video sequence is obtained from a video, and video includes; television, movie, image sequence from a video camera or other observer and further states that, video sequence includes one or more frames of the video or can be a portion of the video or

the entire video) to codec 204 for encoding and decoding/reconstruction of the video images/frames (i.e. fig. 2). The processing is based on controlling the quantization, bits per pixel (note; image is made of pixel elements) to adjust the video quality of the video frame/image, which includes a background and foreground/region of interest on a series of frame/image (i.e. abstract, col. 1, lines 55 – 60, col. 3, lines 1 – col. 4, lines 35, col. 5, lines 11 – 22), which are then being reconstructed by codec 204.

Applicant second argument asserts (remarks, page 11, lines 6) that Crinon does not teach MPEG-4 coding.

In response:

Examiner respectfully disagrees; Crinon (i.e. fig. 1, page. 2, paragraph 0016 and paragraph 0029 and page 6, paragraph 0075) clearly teaches video object plane and automatic object segmentation coding used in the MPEG-4 codec.

Applicant third argument (remarks, page 11, last paragraph) have been noted.

In response:

Yang patent was relied upon controlling/adjusting the video quality between foreground/region of interest and background of the video frame/image by controlling the quantization based on bits per pixel to adjust the video quality between foreground/region of interest and background of the frame/image (i.e. abstract, col. 1, lines 55 – 60, col. 3, lines 1 – col. 4, lines 35, col. 5, lines 11 – 22), which meets the limitations as claimed.

Applicant's forth and fifth arguments (remarks, page 12) have been already responded in reply to applicant's first argument.

In view of the above, claims 1 – 29 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Crinon et al, US 2002/0191846 in view of Yang US 6,490,319.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 – 10, 11, 16 – 21, 25 – 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crinon et al, US 2002/0191846 in view of Yang US 6,490,319.

Regarding claims 1 and 18, Crinon '846 teaches, a method and apparatus (figs. 5A – 5B, 6) for encoding a video sequence (fig. 1, 18), said video sequence (fig. 1, 18) comprising a background composite (paragraph 0005 and 0009, i.e. background mosaic) and foreground regions (paragraphs 0005, 0009, i.e. foreground object), encoding the video sequence (page2, paragraph 0016, page 6, paragraph 0075, i.e. MPEG-4, figs. 5A: 32), and a computer to encode the video sequence (figs. 5A – 5B shows an automatic segmentation coder with MPEG-4 coding. MPEG-4 also allows software implemented coding, thus would have involved a computer to carry out the coding).

Crinon '846 as discussed in the above, teaches encoding video sequence including composite background and foreground.

Crinon '846 patent is silent in regards to explicitly mention, encoding video sequence "based on balancing bits per pixel between regions" to achieve similar quality between the regions.

Yang '319 in the same field, teaches a bit rate controlling technique that utilizes adaptive quantization levels to adjust the quality of regions of a video image by bit balancing between the background and foreground regions, and achieving real-time performance (col. 1, line 56 – col. 2, line 7, col. 3, line 33-42, col. 5, line 23-28, see also fig. 4 and its respective disclosure). Yang disclosure teaches, a video system including video camera 202 which capture and transmits a sequence of video images/frames (i.e. as stated in the specification "page 13" of the instant application; video sequence is obtained from a video, and video includes; television, movie, image sequence from a video camera or other observer and further states that, video sequence includes one or more frames of the video or can be a portion of the video or the entire video) to codec 204 for encoding and decoding/reconstruction of the video images/frames (i.e. fig. 2). The processing is based on controlling the quantization, bits per pixel (note; image is made of pixel elements) to adjust the video quality of the video frame/image, which includes a background and foreground/region of interest on a series of frame/image (i.e. abstract, col. 1, lines 55 – 60, col. 3, lines 1 – col. 4, lines 35, col. 5, lines 11 – 22), which are being reconstructed by codec 204.

In view of the above, taking the combined teaching of Crinon '846 and Yang '319 as a whole, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to adopt the technique of bit balancing between the

background and foreground regions as taught by Yang and apply the same to encoding video sequence of Crinon to balance the bits between background composite and foreground regions as claimed, to achieve real-time bit rate control that results in no quality contrast differential between the background composite and foreground regions.

Regarding claim 2, the limitations claimed have been analyzed and rejected with respect to claim 1 above.

Regarding claim 3, the claimed shape/texture read on MPEG-4 coding as taught by Crinon (see para 0016, also para 0038-0039, also shape information is associated with video object plane VOP).

Regarding claims 4 and 7, which further recite wherein the bits per pixel for background and bits per pixel for foreground are related by a balancing factor, see (Yang, col. 5, lines 13 – 22).

Regarding claims 5 – 6, which further recite balancing factor comprises a correction factor (claim 5), and balancing factor comprises a quality factor (claim 6), the claimed limitations read on quantization rate controller and bit balancing which have been analyzed and rejected with respect to claim 1 above.

Regarding claim 8, Crinon '846 is silent in regards to actual number of bits.

Crinon '846 teaches, a method and apparatus (figs. 5A – 5B, 6) for encoding a video sequence (fig. 1, 18), said video sequence (fig. 1, 18) comprising a background composite (paragraph 0005 and 0009, i.e. background mosaic) and foreground regions (paragraphs 0005, 0009, i.e. foreground object), encoding the video sequence (page2, paragraph 0016, page 6, paragraph 0075 i.e. MPEG-4, figs. 5A: 32), as discussed with

respect to claim 1 above. Furthermore, Yang '319 teaches that typically, visual quality of the foreground object is achieved at the expense of the background quality, and balancing the quality differential between the regions for real-time performance is difficult when the content and data rate of a video image change (col. 1, line 24-31). Hence, Yang '319 suggests a bit rate controlling technique, which both regions of the video image are quantize to the same level, this quantization level is referred to maximum quantization level for both foreground and background provides an actual bit rate for the video frame, which is close to the target bit rate (col. 1, line 56 – col. 2, line 7, col. 3, line 33 - 42).

In view of the above, taking the combined teaching of Crinon '846 and Yang '319 as a whole, it would have been obvious to one skilled in the art at the time of the invention was made to adopt the technique of bit balancing (quantization control) between the background and foreground regions as taught in Yang and apply the same to balance the bits between background composite and foreground regions as claimed to achieve real-time bit rate control that results in no quality contrast differential between the background composite and foreground regions.

Regarding claims 9 and 20, iterative processing/encoding as claimed is shown in Crinon (figs. 5A-5B, figs. 6 – 7).

Regarding claim 10, Crinon '846 is silent in regards to "determining an estimated background quantization step based on an estimated number of bits for the compressed background composite and the number of bits for the compressed background composite".

However, such features are well known and used in the prior art of the record, as evidenced by Yang (i.e. col. 3, lines 33 – 42) wherein, "an estimated background quantization step" reads on (Qmax), and "estimated number of bits for the compressed background," reads on (target bit rate, R), and "number of bits for the compressed background composite" reads on (actual bit rate).

Regarding claim 11, the combined teaching of Crinon '846 and Yang '319 as analyzed and rejected with respect to claims 1 and 18 above also teaches determining a starting foreground quantization step for the foreground regions based on a background quantization step for the background composite and a desired bit rate (see Yang, col. 3, lines 33 – 42).

Regarding claims 16 – 17, which recite a computer system and a computer-readable medium, these limitations have been analyzed and rejected with respect to claims 1 and 18 above.

Regarding claims 19 and 27, the limitations claimed have been analyzed and rejected with respect to claims 1, 8 and 11 above.

Regarding claim 21, the limitations claimed have been analyzed and rejected with respect to claim 10 above.

Regarding claims 25 – 26, the limitations claimed have been analyzed and rejected with respect to claims 16 – 17 above.

4. Claims 12 – 15, 22 – 24 and 28 - 29, are rejected under 35 U.S.C. 103(a) as being unpatentable over Crinon et al, US 2002/0191846 in view of Yang US 6,490,319 further in view of Ryoo (US 5,990,957).

Regarding claims 15 and 24, combination of Crinon '846 and Yang '319 teaches, encoding the video sequence based on balancing bits per pixel as analyzed and rejected with respect to claim 1 above. Crinon further suggest block skipping (page 3, paragraph 0040), which can be used for controlling bit rate during encoding. However, the combined teaching of Crinon and Yang lacks details of block skipping technique.

Ryoo '957 (i.e. col. 7, lines 20 – 34) teaches block skipping and block variance to estimate/control the bit amount/rate of each video object. The combined teaching of Crinon and Yang as applied to claim 1 above has obviated bit balancing.

Therefore, taking the combined teaching of Crinon '846 and Yang '319 and Ryoo '957 as a whole, it would have been obvious to one skilled in the art at the time of the invention was made to control the bit amount of each video object by determining the picture/block variance and frame skipping as taught by Ryoo (col. 7, lines 20 – 34) for the benefit of efficiently allocating appropriate bit amount to each video object (col. 2, lines 6 – 11, Ryoo).

Regarding claim 12, the limitations claimed have been analyzed and rejected with respect to claim 15 above.

Regarding claims 13 – 14, combination of Crinon '846 and Yang '319 and Ryoo '957 teaches, frame dropping, as discussed with respect to claim 12, and temporal sub-sampling and bit-budget, claim 13 (col. 11, lines 45 – 55 of Ryoo, and also col. 5, lines 13 – 20 of Yang), and actual number of bits, claim 14 (Yang, col. 3, lines 35 – 40).

Regarding claims 22 - 23, the limitations claimed have been analyzed and rejected with respect to claims 12 – 13 above.

Regarding claims 28 – 29, the limitations claimed have been analyzed and rejected with respect to claims 22 and 24 above.

Conclusion

5. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Behrooz Senfi** whose telephone number is **(571) 272-7339.**

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Mehrdad Dastouri** can be reached on **(571) 272-7418.**

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

Or faxed to:

(571) 273-8300

Hand-delivered responses should be brought to Randolph Building, 401 Dulany Street, Alexandria, Va. 22314.

Any inquiry of a general nature or relative to the status of the application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is **(571) 272-6000**.

B. M. S.

9/7/2006

Mehrdad Dastouri

MEHRDAD DASTOURI
SUPERVISORY PATENT EXAMINER
TC 2600